

REMARKS

Claims 1-37 are pending in the application. Claim 1 and 20 are amended to more particularly point out and distinctly define the presently claimed subject matter. The amendments are supported by original claims 9 and 28. Claims 9 and 28 are also amended to more particularly point out and distinctly define the presently claimed subject matter. The amendments are supported by original claims 10 and 29, and also on page 16 of the specification, in the paragraphs discussing Figs. 5 and 6. No new matter is being entered.

In the Office Action, claims 1-37 are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 1-37 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Claims 1-3, 5-9, and 11-12 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 3, 720, 615 to Izumi et al. ("Izumi"), or in the alternative under 35 U.S.C. 103(a) as allegedly being obvious over Izumi. Claims 1-4, 6-7, and 9-12 are rejected as allegedly being obvious over U.S. Patent No. 4,177,153 to Lowe ("Lowe"). Claims 13, 15-16, and 18 are rejected as allegedly being obvious over Lowe in view of U.S. Patent No. 5,344,579 to Ohtani et al. ("Ohtani"). Claims 14, 17, and 19 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Lowe in view of U.S. Patent No. 6,225,266 to Watts et al. ("Watts"). Claims 20-35 are rejected under 35 U.S.C. 103(a) as allegedly being obvious over Lowe in view of U.S. Patent No. 4,795,583 to Papay ("Papay") and U.S. Patent No. 6,844,301 to Field et al. ("Field"). Claim 36 is rejected under 35 U.S.C. 103(a) as allegedly being obvious over Lowe in view of Field, and further in view of Ohtani. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowe in view of Papay and Field, and further in view of Watts.

All rejections are respectfully traversed. Reconsideration and allowance of claims 1-37 are respectfully requested in view of the following remarks. In addition, Applicants wish to assert on the record that "power transmission fluid" is intended to be a claim limitation and not an intended use phrase, as the Office Action states. The prosecution history has relied extensively on this limitation to aid in differentiating the presently

claimed subject matter from the cited references. Such reliance should be recognized and is supported by MPEP 2111.02 and well established case law.

Furthermore, the phrase “power transmission fluid” would be understood by one of ordinary skill in the art as referring to a lubricating fluid having properties and additives suitable for use in the extremely demanding environment of a power transmission. A lubricant composition designed for a particular lubrication environment may not be suitable for a different lubrication environment. To this effect, a power transmission fluid contains particular additives in particular proportions that are not necessarily desirable in, for example, a crankcase fluid or a hydraulic fluid, even though all three fluids fall under the broad category of lubricating fluids. For at least these reasons, “power transmission fluid” should be deemed a limitation in the consideration of the present claims.

A. Claims 1-37 Comply with 35 U.S.C. §112, First Paragraph

Claims 1-37, as amended, fully comply with the written description requirement of 35 U.S.C. §112, first paragraph. Claims 1 and 20 are independent claims. The claims are amended to include an upper limitation on the range of tertiary amine present in the composition required to achieve the objective of providing increased friction durability to a power transmission fluid. Support for the claimed range may be found in original claims 9 and 28, and throughout the specification. Since claims 1 and 20 meet the written description requirements, dependent claims 2-19 and 21-37 also meet the requirements of §112, first paragraph. Accordingly, reconsideration and allowance of claims 1-37 are hereby respectfully requested.

B. Claims 1-37 Are Not Indefinite

Claims 1-37, as amended, are definite. Independent claims 1 and 20 clearly specify both the starting and ending points of the claimed range for the tertiary amine present in the composition required to achieve the objective of providing increased friction durability to a power transmission fluid. Accordingly, the claims are definite, and by extension, so are dependent claims 2-19 and 21-37. Reconsideration and allowance of claims 1-37 are hereby respectfully requested.

C. Claims 1-3, 5-9, and 11-12 Are Patentably Distinguished Over Izumi

Claims 1-3, 5-9, and 11-12 are rejected under 35 U.S.C. §102(b) as being allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over, Izumi. These rejections are respectfully traversed.

Claim 1 defines a power transmission fluid composition including, among other things, an ashless dispersant and an oil-soluble aliphatic tertiary amine present in the fluid in an amount from about 0.5 to about 8 percent by weight. This particular combination of additive components has the unexpected technical advantage of providing increased friction durability to the power transmission fluid as it ages.

The inventor has surprisingly found that a tertiary amine where R_1 comprises an alkyl or alkenyl group having about 1 to 4 carbon atoms and R_2 and R_3 independently comprise one of an alkyl, an alkenyl, an alkynyl, an alkylthioalkyl, a haloalkyl, and a haloalkenyl group having from about 8 to 100 carbon atoms provides significant advantages over other tertiary amines when utilized in a power transmission fluid. For example, it has surprisingly been found that the presently claimed transmission fluids can be used to control friction properties for longer periods than transmission fluids containing other tertiary amines.

During use, tertiary amines in transmission fluids become spent (i.e., degrade and deteriorate) and lose their ability to provide friction control. Typically, once the transmission fluid loses the ability to provide satisfactory friction control, the transmission fluid must be replaced. However, it has been found that by including tertiary amines in transmission fluids in sufficient amounts, a "reserve" of tertiary amine within the fluid may be created. This "reserve" is then available to replace spent tertiary amine, thus providing a transmission fluid capable of providing extended friction control. However, tertiary amines outside the scope of the present claims (such as those defined in the cited references), when included in a transmission fluid in an amount sufficient to provide a "reserve", cause the transmission fluid to fail friction tests, because friction values fall too low. In contrast, the tertiary amines defined in the present claims provide acceptable friction control when utilized in quantities to create a "reserve" of tertiary amine. Thus, the presently claimed transmission fluids continue to effectively control

friction properties longer than other transmission fluids. Test data and examples supporting these findings may be found in the specification as originally filed.

Nothing in Izumi discloses, teaches, or suggests a power transmission fluid comprising the particular oil-soluble tertiary amine component described in the present application and present in the fluid in an amount from about 0.5 to about 8 percent by weight. Izumi discloses fluids containing, for example, 0.06, 0.14, and 0.2 percent by weight, of an aliphatic tertiary amine. In fact, the tertiary amine content of all of the examples in Izumi falls well below the presently claimed range.

The rust preventative mixture of Izumi contains A) a polycarboxylic acid and B) an aliphatic tertiary amine. The ratio of A to B in the mixture ranges from 95:5 to 5:95, by weight. This mixture is used in the claimed compositions and the examples of Izumi to provide improved rust preventative properties to oils. However, the examples only provide support for up to 0.2 weight percent of the tertiary amine to be present in the final fluid and achieve the expected results. There is no data presented for more than 0.2 weight percent of the tertiary amine, and thus no conclusion can be drawn from Izumi as to the effects of a higher weight percentage of tertiary amine present in the composition.

Furthermore, Izumi teaches a strong preference for a metal salt dispersant used in combination with the tertiary amine (Abstract). All of the examples in Izumi use a metal salt dispersant (calcium alkybenzene sulfonate). Izumi does not provide any example compositions that compare the performance of a metal salt dispersant with an ashless dispersant.

The compositions of Izumi are said to provide rust prevention and improved demulsifiability characteristics to oil compositions. However, there is no teaching, suggestion, or motivation in Izumi to lead one of skill in the art to the conclusion that either the composition of Izumi or the presently claimed combination of an ashless (non-metal containing) dispersant and a tertiary amine in the claimed range would be effective in providing improved friction durability to a power transmission fluid. Accordingly, Izumi not only fails to provide all of the elements of the present independent claim, but also fails to provide any teaching, motivation, or suggestion that would lead one of skill in the art toward the presently claimed composition for improving friction durability in a

power transmission fluid. Therefore claim 1, as amended, is neither anticipated by, nor obvious over, Izumi.

Claims 2-3, 5-9, and 11-12 depend from claim 1 and add important elements and limitations to the base claim, also not found in Izumi. Accordingly, the rejection with respect to Izumi is overcome and reconsideration and allowance of claims 1-3, 5-9, and 11-12 are respectfully requested.

D. Claims 1-4, 6-7, and 9-12 Are Patentably Distinguished Over Lowe

Claims 1-4, 6-7, and 9-12 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Lowe. Claim 1 defines a power transmission fluid and an additive combination that effectively improves the friction durability of the transmission fluid. The fluid contains a base oil, and a power transmission fluid additive composition that includes a dispersant and a tertiary amine, $R_1R_2NR_3$, wherein R_1 comprises about 1 to about 4 carbon atoms and R_2 and R_3 independently comprise about 8 to about 100 carbon atoms. In other words, the tertiary amine contains at least two relatively long chain hydrocarbon groups and at least one relatively short chain hydrocarbon group.

In the Office Action, Lowe was cited as the primary reference in most of the obviousness rejections. Lowe discloses, teaches, and suggests a crankcase lubricant that provides improved oxidation properties. This is said to be accomplished by a synergistic combination of a sulfur-containing antioxidant and a tertiary amine having one R group having at least 11 carbon atoms. There is no disclosure in Lowe relating to power transmission fluids or methods to improve the friction durability of power transmission fluids and thus Lowe fails to teach, suggest, or disclose a power transmission fluid composition as claimed in claim 1.

Additionally, Lowe discloses that amines having one relatively long chain hydrocarbon group having at least 11 carbon atoms are superior in oxidation performance. (See Col. 7, lines 19-26). Further, Lowe expresses in column 4, lines 13-15, a preference for tertiary amines having one relatively long hydrocarbyl chain and two relatively short hydrocarbyl chains. There is nothing in Lowe that teaches, suggests, or discloses a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups as claimed in claim 1. In fact, all of the

examples in Lowe either have only one relatively long chain hydrocarbon group, all short chain hydrocarbon groups, or all long chain hydrocarbon groups.

The fact that Lowe considers the use of all classes of aliphatic tertiary amines **except** ones having two long chains and one short, would lead one of skill in the art reading Lowe to conclude that such amines would not be useful, and thus such a person would have no reason to explore the properties of compositions containing the presently claimed amines.

Furthermore, the presently claimed composition possesses an unexpected property not discernible from Lowe. The specification of Lowe teaches improved oxidation properties in crankcase oils. Friction durability is not considered in Lowe, nor would one of skill in the art infer from Lowe that friction durability could be affected by the use of any tertiary amine and dispersant combination, let alone the combination presently claimed. The claimed combination of an ashless dispersant and an aliphatic tertiary amine having two long chains and one short chain is critical to providing improved friction durability to power transmission fluids. In addition to the particular tertiary amine, the presently claimed weight range of the amine in the finished fluid is also critical to achieving the unexpected benefits of the invention.

Lowe, in Column 3, from Lines 5-7, expresses preference for 0.01, or 0.05, up to 0.3 percent by weight, whereas the present claims require at least 0.5 percent by weight of the tertiary amine. As evidenced by Figs. 2- 6, and as discussed on pages 15-16 of the specification, power transmission fluids containing 4.0 weight percent of the claimed tertiary amine have better friction durability than fluids containing 1.0, 0.5, or 0.0 weight percent of the claimed tertiary amine. Thus, the presently claimed combination of components, in the recited proportions, imparts the property of improved friction durability to the power transmission fluid. This property is neither predicted by the disclosure, nor possessed by the fluids, of Lowe. The presence of an unexpected effect not possessed by the alleged prior art is evidence of nonobviousness (MPEP 706.02(a) III).

Finally, there is no teaching, suggestion, or disclosure in Lowe to provide a composition that contains a dispersant and a particular tertiary amine component in order to provide the advantages of the claimed invention. In fact, Lowe clearly suggests that

the required components for a reduction in oxidation of a crankcase lubricant are a sulfur-containing antioxidant component and a tertiary amine component. While dispersants may be included, there is no specific teaching in Lowe that would lead one skilled in the art to select the combination of applicants' amine with a dispersant for any purpose, much less for the purpose of improving the friction durability of a transmission fluid.

Even if Lowe provided all of the elements of the present claim, which it does not, the reference would still not render the claim obvious to a person of ordinary skill in the art for at least the reasons given above. Hence, Lowe fails to teach, suggest, or disclose all of the elements of independent claim 1.

Claims 2-4, 6-7, and 9-12 depend from claim 1 and add additional important elements and limitations, also not found in Lowe, to the base claim. Since the independent claims is shown to be patentable over Lowe for at least the reasons discussed above, the dependent claims should also be patentable for the same reasons. Accordingly, reconsideration and allowance of claims 1-4, 6-7, and 9-12 are believed in order and are respectfully requested.

E. Claims 13, 15-16, and 18 Are Patentably Distinguished Over Lowe in view of Ohtani

Claims 13, 15-16, and 18 are dependent on claim 1 and are rejected as allegedly unpatentable over Lowe in view Ohtani. This rejection is respectfully traversed.

The claims are patentable over Lowe, as dependent from claim 1, for at least the reasons discussed in part D above. In an attempt to remedy the manifest deficiency of Lowe to render the present claims unpatentable, Ohtani is added to the combination. However, this combination also fails to render the present claims obvious.

Ohtani discloses a lubricant composition comprising a hydroxyalkyl aliphatic imidazoline and a di(hydroxyalkyl) aliphatic tertiary amine. The di(hydroxyalkyl) aliphatic tertiary amine is disclosed as containing two hydroxyalkyl groups containing 2-4 carbon atoms and one aliphatic group containing 10-25 carbon atoms. Tertiary amines having hydroxyalkyl substituents are outside the scope of the presently claimed tertiary amines, which are disclosed on page 4 of the specification as including alkyl, alkenyl, alkoxyalkyl, or saturated or unsaturated fatty acids, but even if such groups were to be

included in the scope of the presently claimed amine, Ohtani still teaches a tertiary amine with two short chain hydrocarbon groups and one long chain hydrocarbon group.

Therefore, nothing in Ohtani discloses, teaches, or suggests a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups, as claimed in claim 1.

One of skill in the art would find no motivation to combine Lowe with Ohtani since Lowe is directed toward a crankcase lubricant with improved oxidation properties and Ohtani is directed toward a lubricant composition for maintaining a substantially constant static breakaway coefficient of friction. Further, purely for the sake of argument, even if one of skill in the art did look to combine Lowe with Ohtani, in spite of the lack of motivation for doing so, one might substitute the tertiary amine having one R group having at least 11 carbon atoms of Lowe with the di(hydroxyalkyl) aliphatic tertiary amine of Ohtani. Such a combination would result in a crankcase lubricant containing a di(hydroxyalkyl) aliphatic tertiary amine. However, such a combination would still not meet the limitations of claim 1, i.e., of providing a power transmission fluid having a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups.

Accordingly, the combination of Lowe with Ohtani fails to teach, disclose, or suggest all of the elements of the independent claim 1, and by proxy, dependent claims 13, 15-16, and 18. Reconsideration and allowance of claims 13, 15-16, and 18 are hereby respectfully requested.

F. Claims 14, 17, and 19 Are Patentably Distinguished Over Lowe in view of Watts

Claims 14, 17, and 19 are dependent on claim 1 and are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Lowe in view Watts. This rejection is respectfully traversed.

The claims are patentable over Lowe, as dependents from claim 1, for at least the reasons discussed in part D above. In an attempt to remedy the manifest deficiency of Lowe to render the present claims unpatentable, Watts is added to the combination. However, this combination also fails to render the present claims obvious.

Watts discloses a zinc-free lubricating composition comprising, among other components, a friction modifier that is selected from the group consisting of succinimides and ethoxylated amines. The ethoxylated amine is disclosed as containing one relatively long chain and two ethanol groups. Therefore, nothing in Watts discloses, teaches, or suggests a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups as claimed in claim 1.

In addition, one of skill in the art would find no motivation to combine Lowe with Watts. Lowe is directed toward a crankcase lubricant with improved oxidation properties. Further, Lowe discloses and teaches that its crankcase lubricant compositions contain from 2 to 40 mmols of zinc per kilogram or from 9 to 40 mg of zinc per kilogram of oil. (See Col. 2, lines 62-64 and Col. 4, lines 21-53). Watts is directed toward a zinc-free lubricant composition for providing enhanced low temperature friction characteristics. The proposed combination would alter the principle of operation of the references, and thus is untenable.

Further, purely for the sake of argument, even if one of skill in the art did look to combine Lowe with Watts, in spite of the lack of motivation for doing so, one might substitute the tertiary amine having one R group having at least 11 carbon atoms of Lowe with the ethoxylated amine containing one relatively long chain and two ethanol groups of Watts. Such a combination would result in a crankcase lubricant containing an ethoxylated amine containing one relatively long chain and two ethanol groups. However, such a combination would still not meet the limitations of claim 1, i.e., of providing a power transmission fluid having a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups.

Accordingly, the combination of Lowe with Watts fails to teach, disclose, or suggest all of the elements of independent claim 1. Claims 14, 17, and 19 depend from claim 1 and add further important elements and limitations to the base claim. Hence, reconsideration and allowance of claims 14, 17, and 19 are hereby respectfully requested.

G. Claims 20-35 Are Patentably Distinguished Over Lowe in view of Papay and Field

Claims 20-35 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Lowe in view of Papay and Field. This rejection is respectfully traversed.

Claim 20 is an independent claim that defines a method for improving the friction durability of a transmission fluid. The method includes preparing a transmission fluid by adding to a base oil, an additive composition comprising: an ashless dispersant and an oil-soluble tertiary amine component, $R_1R_2NR_3$, wherein R_1 comprises about 1 to about 4 carbon atoms and R_2 and R_3 independently comprise about 8 to about 100 carbon atoms. In other words, the tertiary amine contains at least two relatively long chain hydrocarbon groups and at least one relatively short chain hydrocarbon group.

Lowe discloses, teaches, and suggests a crankcase lubricant that provides improved oxidation properties. This is accomplished by a synergistic combination of a sulfur-containing antioxidant and a tertiary amine having one R group having at least 11 carbon atoms. There is no disclosure in Lowe relating to power transmission fluids or methods to improve the friction durability of power transmission fluids and thus Lowe fails to teach, suggest, or disclose the method as claimed in claim 20. Further, nothing in Lowe teaches, suggests, or discloses a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups. Lowe fails to meet the compositional limitations of the fluid claimed in claim 20 to provide the claimed improvement in friction durability of a power transmission fluid. The failure of Lowe to provide all of the elements and limitations of the composition required to enact the method of the present claim is further discussed, with relation to claim 1, in part D above.

Papay discloses an automotive transmission fluid comprising, amongst other components, an aliphatic tertiary amine having one long chain and two short chain groups. (See Abstract). The amine is disclosed as containing one long chain having at least 10 carbon atoms and two short chains having up to 4 carbon atoms. Therefore, nothing in Papay discloses, teaches, or suggests a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups as claimed in claim 20.

Field discloses a synthetic ester-containing engine lubricant containing an amine-based friction modifier for improved engine performance and cleanliness. The amine-based friction modifier may be a tertiary amine containing a relatively short chain alcohol. Alcohol containing amines are outside of the scope of the present claims, as read in light of the teachings of the present specification, as discussed in part E above (hydroxyalkyl groups are alcohols). The tertiary amine of present claim 20 defines R1 as comprising an alkyl or alkenyl. Therefore, nothing in Field discloses, teaches, or suggests a tertiary amine containing one short chain hydrocarbon group and two relatively long chain hydrocarbon groups as claimed in claim 20.

Even if the combined references provided all of the elements of the present claim 20, which they do not, one of skill in the art would find no motivation to make the proposed combination. Lowe is directed toward a crankcase lubricant with improved oxidation properties. Papay is directed toward an automotive transmission fluid. Field, like Lowe, is directed toward a crankcase fluid. Each fluid is known to one of ordinary skill in the art as being formulated with different additives to provide the fluids with properties specific for the particular application of the fluid. Such a person would not reasonably combine the disclosures of Lowe, Papay, and Field and arrive at any sort of prediction regarding combining any of the disclosed components of Lowe, Papay, or Field to provide improvements in the friction durability of a power transmission fluid.

Applicants respectfully submit that none of the cited references provide all of the elements and limitations of claim 20. Therefore, even if one of ordinary skill in the art were to combine these references in some way, that person would still not arrive at the presently claimed method for improving friction durability of a power transmission fluid.

Therefore, claim 20 is patentable over the combination of Lowe, Papay, and Field. Dependent claims 21-35 are also patentable over the references for at least the same reasons that claim 20 is patentable. Accordingly, reconsideration and allowance of claims 20-35 is hereby respectfully requested.

H. Claim 36 Is Patentably Distinguished Over Lowe in view of Papay and Field and further in view of Ohtani

Claim 36 is dependent on claim 20 and is rejected as being allegedly unpatentable over Lowe in view of Papay and Field, and further in view of Ohtani. This rejection is respectfully traversed.

None of the cited references disclose the particular tertiary amine as claimed in claim 20. The deficiency of Lowe, Papay, and Field to disclose this limitation is discussed in part G above. The deficiency of Ohtani to disclose this limitation is discussed in part E above. While the discussion of Ohtani from part E pertains to the composition as recited in claim 1, the discussion remains pertinent as the same compositional limitations are also contained in claim 20. Therefore, the combination of Lowe with Papay, Field, and Ohtani remains manifestly deficient in providing all of the elements of claim 20 for at least the reasons discussed herein, and therefore the claim is patentable over the combined references. Accordingly, claim 36, as dependent upon independent claim 20, is likewise nonobvious and patentable in view of the cited combination of references, and reconsideration and allowance of claim 36 is hereby respectfully requested.

I. Claim 37 Is Patentably Distinguished Over Lowe in view of Papay and Field and further in view of Watts

Claim 37 is dependent on claim 20 and is rejected as being allegedly unpatentable over Lowe in view of Papay and Field and further in view of Watts. This rejection is respectfully traversed.

The deficiency of Lowe, Papay, and Field to disclose this limitation is discussed in part G above. The deficiency of Watts to disclose this limitation is discussed in part F above. While the discussion of Watts from part F pertains to the composition as recited in claim 1, the discussion remains pertinent as the same compositional limitations are also contained in claim 20. Therefore, the combination of Lowe with Papay, Field, and Watts remains manifestly deficient in providing all of the elements of claim 20 for at least the reasons discussed herein, and therefore the claim is patentable over the combined references. Accordingly, claim 37, as dependent upon independent claim 20, is likewise

nonobvious and patentable in view of the cited combination of references, and reconsideration and allowance of claim 37 is hereby respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of all pending claims.

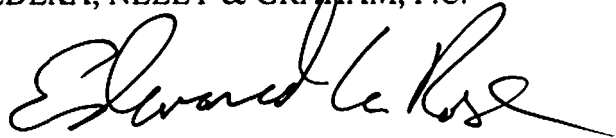
FEES

This filing is accompanied by a Petition for Revival for Unintentional Abandonment, along with the required fee of \$1540.00, as well as a Request for Continued Examination, along with the required fee of \$810.00. However, if the fee calculations are incorrect, the Commissioner is hereby authorized to charge any deficiencies in fees or credit any overpayment associated with this communication to Deposit Account No. 12-2355.

Respectfully submitted,

LUEDEKA, NEELY & GRAHAM, P.C.

By:

A handwritten signature in black ink, appearing to read "Edward C. LaRose", written over a horizontal line.

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